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AMERICAN CINEMATOGRAPHER

THE MOTION PICTURE CAMERA MAGAZINE

VOL. 27 JUNE, 1946 NO. 6

CONTENTS

ON THE FRONT COVER Producer-director Joseph Burne conducts final rehearsal of a musical number for "Down Missouri Way"—PRC production. Director of Photography Vincent J. Farrar, A. S. C., is at right of the camera checking the scene.

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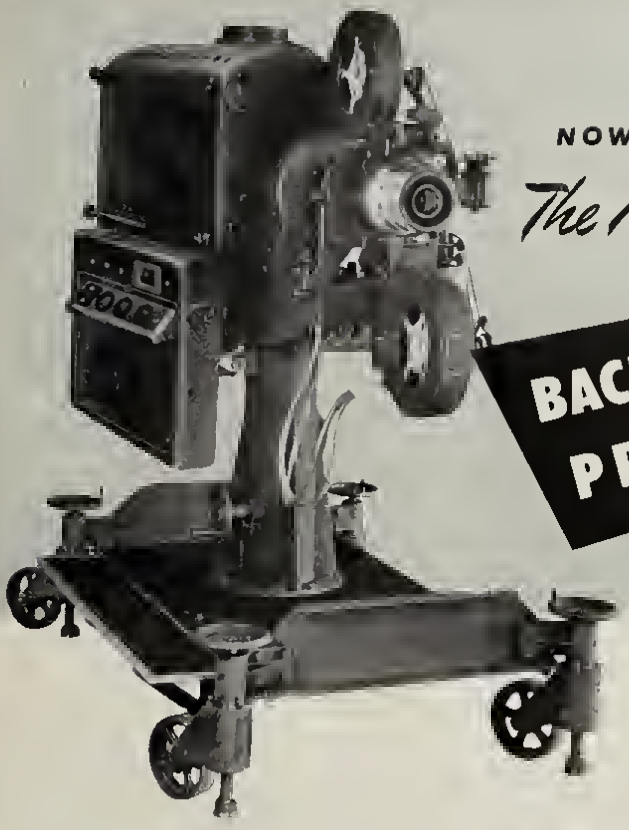

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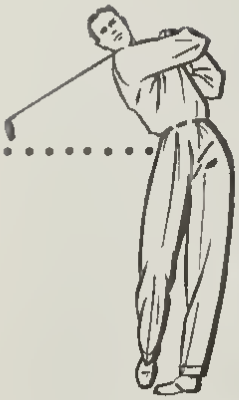

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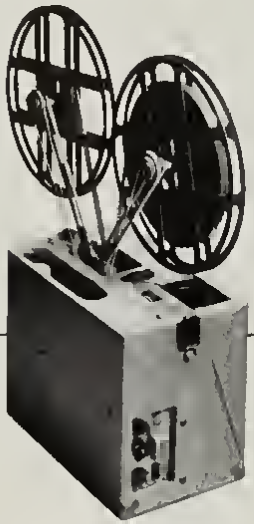

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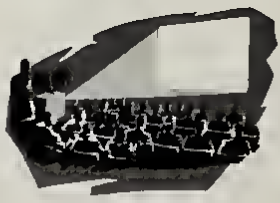

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MAJOR P. M. THOMAS and CAPTAIN C. H. COLES

(A.A.F., Special Photographic Services, Wright Field, Ohio)

Historical

Although sporadic attempts had been made from time to time at Wright Field to employ the latest methods of photography toward the solution of aircraft problems, no concentrated effort was made to press its advantages until the Photographic Engineering Branch of the Technical Data Laboratory, Engineering Division, was organized in the middle of 1943. Now it has grown to a total personnel of 65, and has spread into 2 buildings. Its work has been deemed so important that its program has remained virtually unchanged since V-J day.

Organization

The organization gives a good idea of how a problem is attacked When a laboratory on Wright Field requests work to be done, the Projects Branch surveys the problem The varied experience of its project engineers is of tremendous value in deciding a method of attack. One of these engineers makes an outline of the essential information to be obtained, Dr. H. E Edgerton and Gjon Mili, staff consulants for this organization, may be called in for advice.

(This paper was originally presented at October 1945 Technical Conference of Society of Motion Picture Engineers, and published in March 1946 issue of SMPE Journal. Reprinted by special permission.)

As an example, the Jet Powered Unit requested that velocity and acceleration studies be made of the take-offs of the newly completed American version of the German V-1 flying bomb. A project engineer flew to the test base where the launching ramps were under construction. He decided that a camera tower had to be constructed at a certain location and 10-foot distance markers erected along the launching track. These were built under his direction.

The project was now turned over to the Field Branch and a crew was sent with high-speed motion picture cameras, batteries, timers, and developing equipment. The first few take-offs of the experimental bombs were filmed and the records flown back to Wright Field, where the Analysis Branch took over. Here the films were studied and velocity and acceleration curves were drawn from the information obtained from the films.

The curves and tables were now returned to the same project engineer who initiated the action. From these data he assembled the final report and submitted it to the engineers of the Jet Powered Unit. This completed the job

An interesting side light on this particular project was that the films showed not only that the first flying bombs failed to attain adequate speed to enable them to fly, but also the exact cause of the failure. It was poor rocket placement and consequent loss of power during take-off.

The high-speed photographic equipment does only a part of the work of the organization Special photographic triangulation methods are employed to determine the height of aircraft and bombs at any point, the path of an airplane or falling projectile, the successive positions in space of a helicopter or a parachute

When existing cameras are inadequate for a required purpose, the Installation and Fabrication Unit designs its own or turns its specifications over to a commercial company A specially constructed camera of this type is being used to photograph the indications on instrument panels during flight tests or wind-tunnel tests One of the first to come off the production line was used to make the famous pictures of the explosion of the first atomic bomb in New Mexico

Color photography has grown in importance as a recording medium for engineering data Corrosion, combustion, color signals, moisture detectors, medical subjects, all require color photography for adequate recording. Complex production graphs and engineering charts also require color for clarity. To

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Take off of jet propelled bomb as photographed by automatic camera at Proving Ground AAF Special Photographic Services Section Wright Field Ohio

CINEMATOGRAPHIC MAGIC FOR "A STOLEN LIFE"

By HERB A. LIGHTMAN

WHEN this year's Academy Awards are announced next March, the leading contenders for top honors in photographic achievement will most certainly include Sol Polito, A.S.C., and the Warner Bros. special effects department for their inspired lensing of the new Bette Davis starring film, "A Stolen Life."

This picture is outstanding for several reasons. Firstly, because it is absorbing, adult entertainment tastefully presented, secondly, because it represents a forceful blending of all phases of production. Critics and students of cinema technique will regard it as a triumph of cameracraft because of the many imposing photographic problems that had to be overcome in order to put this unusual story on film.

"A Stolen Life" concerns a set of twins (both played by Bette Davis), one of whom is a brittle, glittering sophisticate, the other a sincere, genuine, rather plain girl who likes to paint. The two twins appear together in many scenes throughout the film, and it is in these dual-role sequences that the picture rises into a class by itself. The illusion of "twins" is perfect, the effect so convincing that even veteran film technicians admit that it has them fooled. There is absolutely no hint of artificiality or trick-work in these sequences; on the contrary, they are executed with incredible smoothness and a complete atmosphere of reality.

Double image effects of this type are, in principle, not at all new. Back in the silent film days the illusion was achieved by means of **split-screen** photography in which only half of the film was exposed at a time, with the actor being photographed first on one half of the frame and then on the other half to give the illusion that he was acting opposite himself.

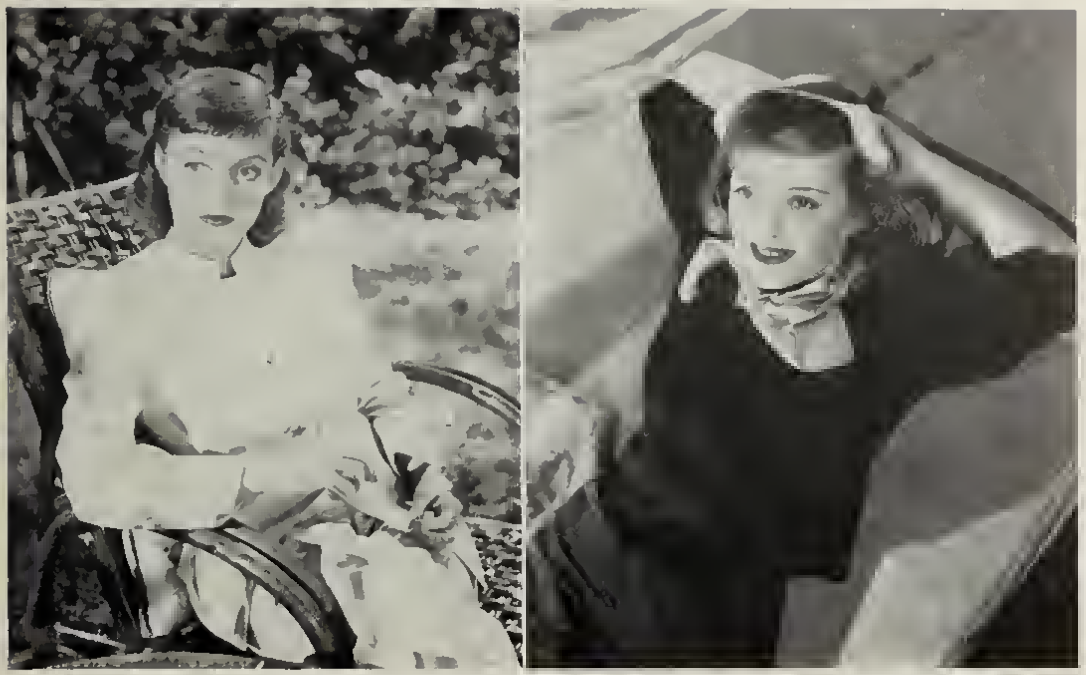
Later, this obvious and somewhat clumsy technique was replaced by the **traveling matte** process in which an actor was first photographed on a full set with the dialogue and action keyed to allow for the appearance of his "alter ego." Then the same actor would act out the **twin** role against a black curtain and this image would later be superimposed over the original scene showing the full set. The **traveling matte** process was fairly satisfactory, except for the fact that the superimposed image frequently seemed to have a black line around it.

Recently, more convincing techniques have been perfected, and the ultimate in double-image illusion has been achieved in "A Stolen Life." In shooting this picture, cinematographer Sol Polito crystallized all the advances that had been made to date in this type of filming, and added certain refinements of his own. Discarding both the split-screen and **traveling matte** processes, he utilized a method in which the matte work was done, not in the camera, but in the special effects lab.

SOL POLITO, A. S. C.

To illustrate the general process used, let us take for example a scene from the picture in which Bette Davis is seated in a large chair. Her "twin" crosses the screen and stands behind the chair talking to her. The scene was first shot with Miss Davis seated in the chair while a double went through the actions

FRAME BLOW-UPS from the Warner Brothers production "A Stolen Life." Left: Bette Davis in her dual role. Right: frame enlargement of one of the most difficult scenes in the picture. This "dolly shot" was made in front of a process screen with Bette Davis walking a treadmill in front of it. She played the scene on one half of the frame, then on the other half. Later, the two scenes were optically blended in the special effects lab. Brilliant special effects by Director of Photography Sol Polito, A.S.C., and his staff produce a perfect illusion of twins.



DUAL ROLE Bette Davis on left as PATRICIA BOSWORTH—a ruthless glittering sophisticate who steals her twin sister's man Right, as KATE BOSWORTH—a sincere repressed, rather plain girl who likes to paint

of the twin sister. Then another take was made of the same scene, this time with the double seated in the chair and Miss Davis taking the part of the other twin. In the special effects lab, the parts of both scenes which showed the double were masked out by means of irregular mattes, and the parts showing Miss Davis were then fitted together like an animated jig-saw puzzle, resulting in the illusion that she was playing opposite herself.

In executing this effect the camera had to be securely clamped in place so that the backgrounds would match when the two fragments of the scene were printed together. Dialogue was keyed by means of a **playback** recording so that all of the action of both twins could be synchronized. The use of a double in parts of the scene to be masked out allowed her shadow to fall naturally about the set, and gave Miss Davis a chance to react normally to the dialogue and movements of another person.

In previous dual-role films, the actor playing the double part was greatly restricted in his movements. He had to remain more or less static and could not approach too closely to his "other self." As far as his overlapping himself bodily was concerned, that was out of the question. In "A Stolen Life," all of these former restrictions have been done away with. The two Bette Davises move freely about with one another, one walking in front of the other. They lie down very close together on the same bed; one twin touches the other. They cast realistic shadows, and give the perfect illusion of an actual set of twins.

Several scenes presented technical problems that would have seemed to be insurmountable, but Polito and his assistants took them all in stride and produced admirable results. For instance, one scene called for a **dolly shot** of the twins walking down a long wharf. In the background crowds of people were milling about, crossing the set behind the two walking figures, and creating a good deal of background movement. This scene was shot in front of a process screen with Miss Davis on a treadmill to simulate the walking action. Separate takes were made of her on each side of the screen and the two were blended in the special effects lab. But because the background was moving, extreme care had to be taken to make sure that the background action on both halves would match. Here the blending had to be synchronized down to the last frame, and operation of the rear projector had to be absolutely consistent. A good deal of mathematics and timing entered into the process.

In another scene Miss Davis lights a cigarette for her twin, smoothes her hair, etc. This was executed by having Miss Davis play the scene opposite a double who lit her cigarette and performed other actions at close range. Later, in the lab, just the double's face was masked out and Miss Davis' head was literally placed on her shoulders.

Sometimes in complicated scenes in which the twins appeared together, as many as five different irregularly shaped mattes were used to properly match the action. Naturally, all action of this type had to be closely keyed and rehearsed to fit the pace and tempo of the scene. Moreover, from the cameraman's point of view it was essential that the lighting and exposure on both halves of the scene be identical.

Polito emphasizes the fact that the final results produced were no **one-man** accomplishment. He is indebted to his assistants and to the Warner Bros. special effects department, with special credit going to Art Director Robert Haas and to Russell Collings, A.S.C., for his precise and painstaking work in optically blending the component parts of the dual-action scenes. It was Collings who created the many mattes that were used, matched the halves of the frames optically, and supervised the printing of the composite scenes.

When Polito had finished shooting a greater share of the film, he was suddenly taken ill with appendicitis, and Ernest Haller, A.S.C., stepped in to take over the photographic reins and complete lensing of the picture. Haller's handling of the storm sequence is especially noteworthy. He captured a frightening-ly real feeling of horror at sea, an effect brilliantly aided by the work of William McGann, E. Roy Davidson, and Willard

(Continued on Page 210)

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BOARD OF GOVERNORS FOR AMERICAN SOCIETY OE CINEMATOGRAPHERS for the coming yeai Seated (left to right) Sol Polito, Lee Garmes President Leonard Smith, George Folsey, William Skall Arthui Edeson Standing (left to right) Second Vice President Charles Roshar, First Vice President Leon Shamroy Gordon Jennings Secretary Ray Rennahan Sergeant-at Arms John Boyle Other board members not shown include Fred Jackman Executive Vice President and Treasurer, Third Vice President Charles Clarke, John Seitz and Joseph Walker

LEONARD SMITH RE-ELECTED PRESIDENT OF AMERICAN SOCIETY CINEMATOGRAPHERS

LEONARD SMITH was re-elected President of the American Society of Cinematographers at annual election of the organization last month. Smith will lead the Society during the coming year for his fourth consecutive term.

Fred W Jackman was re-elected Executive Vice President and Treasurer, continuing the dual responsibilities which he has held for several years. Leon Shamroy, Charles Rosher, and Charles G Clarke were selected to serve as First, Second, and Third Vice Presidents, respectively; while Ray Rennahan was re-elected Secretary, and John Boyle elected Sergeant-at-Arms.

Arthur Edeson, George Folsey, and Jackman were re-elected as members of the Board of Directors; with Gordon Jennings and Charles Rosher voted to serve on the latter body.

Veterans of Cinematography

Members of the A S C Board of Directors for the coming year will comprise: John Boyle, Charles G. Clarke, Arthur Edeson, George Folsey, Lee Garmes, Fred W. Jackman, Gordon Jennings, Sol Polito, Ray Rennahan, Charles Rosher, John Seitz, Leon Shamroy, William V Skall, Leonard Smith, and Joseph Walker.

All of the officers and board members are outstanding cinematographers of 20 years experience or more in the film industry. Many have won Academy Awards for black-and-white and color cinematography, while others have productions on the Academy nominations list each year.

Post War Plans for Progress

With new equipment, film stocks, and techniques expected to be available shortly, leaders of the A S C are mapping a complete and comprehensive program for the organization to assist in the testing of such new materials and to make results and findings available to the collective membership. Along these lines is the proposal to install a technical and research building on the present A S C property whereby members—either individually or in groups — will have facilities for experimenting with new techniques or processes for the advancement of cinematography.

President's Message

President Smith, in continuing to lead the A S C for the fourth year, stated: "I am grateful to the membership for honoring me to again lead the organization — which is the greatest and most progressive camera group in the world. Assisted by such a fine and representative group of cinematographers as represented in the Board of Directors, I am certain that we start on the second quarter-century of operation with brightest outlook for even more startling advances in the art and technique of cinematography."

AMONG OFFICERS WHO WILL LEAD A S C this year are (left to right) John Boyle Sergeant atArms Leon Shamroy, First Vice President Leonard Smith, President, Ray Rennahan, Secretary, and Charles Rosher Second Vice-President Fred Jackman continues as Executive Vice President, and Charles Clarke holds post of Third Vice-President

THROUGH the EDITOR'S FINDER

THE twenty-fifth anniversary celebration of the founding of the American Society of Cinematographers, which will be held as an all-industry affair in the Cocoanut Grove of the Ambassador hotel, Los Angeles, on the evening of June 17th, looms as one of the greatest and most representative events of its kind to be presented by Hollywood craftsmen.

Associated artists and technicians of the industry and studios are enthusiastic in extending congratulations and cooperation for the silver anniversary event of the cinematographers, who—down through the years—have contributed so largely to the artistic and technical advances of the motion picture industry.

Guest speakers will include: Governor Earl Warren of California; Louis B Mayer, head of Metro-Goldwyn Mayer studios; Darryl F. Zanuck, production chief of 20th-Fox studios; and pioneer producer-director Cecil B De Mille. Eric Johnston, president of Motion Picture Association of America, will also deliver a brief address if he is on the coast at the time of the event.

Top entertainers of the films and radio will appear to entertain the members and guests, which are expected to tax the capacity of the large and world-renowned Cocoanut Grove.

Cameramen Always For Progress

TIME Magazine of April 22, 1946, in quoting excerpts of an interview of Emil Ludwig with a Paris publication in which he derides various groups in Hollywood film production activities; did, however, include Ludwig's laudatory comment that "cameramen . . . are the only group whose members have learned their trade." Although Ludwig was only in Hollywood for a relatively brief period, he was certainly most observant in the qualifications and capabilities of the cinematographers he witnessed working on the studio stages or on locations.

Down through the years, it is an indisputable fact that the cinematographers—both individually and collectively—have been the most progressive and inventitiv eartists engaged in motion picture production. Their enthusiasm and inventiveness for practical uses of the camera, lights, and other accessories connected with motion picture photography; and probings for new uses of such tools, is all intimately wrapped up in the advanec of the artistic and technical progress of film production.

Cameramen composed the initial group of production craftsmen who met to form an organization for mutual benefit and the advancement of photographic techniques as a whole. This was back in the days prior to 1915, when the bulk of motion pictures was limited to one, two and three reel subjects. Out of the two original organizations of cameramen—informal setups in New York and Los Angeles—finally emerged the American Society of Cinematographers, now into the second quarter century of operation and accomplishment.

Just as important as the A. S. C. members who function as Directors of Photography on productions, is that large group on the A. S. C. roster who function in the process and special effects departments of the studios and producing companies. Continually working to invent and devise new and more economical procedures to create photographic realism and thrills for pictures, and still always bending to reduce production costs for the company.

Special effects and process is most intriguing in both practices and achievements, which is probably major great reason why many cinematographers in that field pass up opportunities to assume charge of regular productions.

FRED JACKMAN re-elected Executive Vice President and Treasurer of the American Society of Cinematographers for the ensuing year.

A. S. C. Members at Bikini

BRIEF word comes from the Marshall Islands that five members of the American Society of Cinematographers—Art Lloyd, Tom Tutwiler, Harry Perry, Paul Perry, and Major Gilbert Warrenton—are fairly comfortably installed in quonset huts at Bikini, and hard at it in directing preparations for the aerial photography operations which are designed to be a most important factor in the atom bomb demonstration to be staged by combined organizations of the United States Navy and Army in July in the Pacific. The aerial photography program is most complete in scope, combining camera planes of many types and descriptions, including radar-controlled planes with cameras that will turn on automatically over various ships and targets to prevent hazardous flights of pilots and cameramen over the target area.

The five A. S. C. members engaged in the most important demonstration are not only outstanding cinematographers—each with wide experience in Hollywood production—but recent officers with either the Signal Corps or AAF photographic units during the war. Major Warrenton is still on active duty with the AAF.

Miniature Camera Models

PFC Gerald R. Olson's Hobby

By IRVING BROWNING

THE greatest diversion in a human life is a hobby, and those who indulge in one will agree with me. I am a hobbyist collector and collect everything movie, even to the magic lantern. I now have enough objects to start and fill a museum. Then, I have a still camera collection which includes all sorts of miniature cameras. Also, I have a collection of unusual lenses and shutters, but this tale is not about my collecting of hobbies but of another unusual hobby, which came about from tinkering in spare time to be practically a paying business.

This hobbyist, Pfc. Gerald R. Olson found his hobby in his love for his work in movies, in which he spent many years in Hollywood. He is now at the Photographic Center of the Signal Corps in Long Island City, New York.

Olson makes interesting objects of his own fancy and he has a particular interest in the Mitchell camera. One day he was toying with bits of wood and out comes a Mitchell camera in miniature. This hobby was developed by his desire to make a suitable gift to the Post Commander, for his personal appreciation for him, so when he completed his first model, he presented it to Col. R. C. Barrett, Commander of the Signal Corps Photographic Center.

Pfc. Gerald R. Olson is a member of Local 44, Hollywood Studio Technicians. He worked at the miniature department of M. G. M. Studios before he entered the service and has been doing miniature work at the Photographic Center, just as he did at M. G. M.

Olson was born in St. Paul in 1911, entered high school and was interested in art. He won the second prize in a contest which included one year's tuition in the St. Paul Art Institute. He left art school to paint in oil and then became interested in modeling, and because of his further interest in aircraft; he has modeled many types of aircraft.

His background is interesting too. His mother was an interior decorator and he worked with her for a while. Then interior decorating became his great aim and he expects to return to that field because he prefers set designing and decorating as a profession.

In 1933 he went to Hollywood hoping to get into the drapery department but was successful in getting a job in the miniature department instead. He worked under Dave Vail at M. G. M.; he also worked for the Lyedecker Brothers at Republic Studios. In 1942 he went into the Signal Corps at Astoria in the drapery and upholstery department. During the war the Signal Corps was producing morale films for the Army and in spite of all the fine subjects that were made there, Olson continued to spend his spare time at his hobby of making miniature cameras.

When the cameramen at the Center saw the first model, there were so many requests for them that Olson took orders and began to work on ten cameras at a time and they went like the proverbial "hot cakes." There were many Hollywood cameramen at the Center who had worked with the Mitchell camera and each one wanted to own a miniature.

Each and every camera miniature requires practically thirty hours of Olson's time to complete, and the only periods he has to give to making them is his spare lunch-time and evenings.

I have seen the Mitchell miniature and from the photographic illustrations on these pages, one can see the minutest details have been carefully executed and every item built to scale. To hold a model in one's hand is to practically believe that the miniature can run. They

Mitchell camera miniature made to scale by Pfc. Olson is 14 inches high from base and complete with finder, motor, and lense mounts which are proportionately 35-50-75-100 mm.

are so true to the original, in fact, Olson says that people who see the model, invariably inquire whether it has a mechanism. These miniatures are made entirely of wood—even the sunshade, bellows and lens mounts which look like metal, are wood.

Hobbies can bring profit as well as pleasure and Olson says that he will make them as long as cameramen and others request them; most cameramen delight in owning a miniature.

What an "Oscar" Olson's miniature Mitchell camera would make for Photographic awards!

PFC. OLSON (left) at work on model of a 120mm. anti-aircraft gun which was used in training film on anti-aircraft. In center is completed gun model, fashioned of wood, tin and zinc. At right are shown models of six-and-a-half ton Army Prime Mover and barrage balloon, also made by Olson.

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Elemental Movie Tricks For The Amateur

By PHIL TANNURA, A. S. C.

(Editor's Note: Because of the numerous requests of amateur movie makers for information on simple trick and process photography which can be accomplished without the necessity of the expensive special effects equipment employed in the Hollywood studios, we are reprinting major portions of article by Phil Tannura, A.S.C., originally published in July 1944 issue of AMERICAN CINEMATOGRAPHER.)

Reverse Action

ONE of the easiest of all camera tricks—and one of most help for slapstick comedy—is reverse action in which everything appears to happen in reverse; men run backward, automobiles glide ghostlike backwards around a curve through traffic, or water comes out of a glass into a pitcher.

If you have a camera with a crank, you get this reverse result by cranking the film backwards. If you have a spring-driven camera you simply hold the camera upside-down when shooting. Then after your film is developed, cut out the scene and replace it in the reel right side up. You do this by turning it end for end.

Simple, isn't it?

I recommend this only in the case of 16mm, and not for 8mm, because the smaller film has only one row of sprocket holes when ready for projection, and when the film is reversed end-for-end the emulsion side is turned away from the lens and throws the picture out of focus.

Making People Disappear

Another simple, yet effective, trick is stopping the camera to make people and inanimate objects appear and disappear.

Never try to do this unless you have your camera on a tripod. It is also important that you have as near static a background as possible, and for your actors to hold a given position while the camera is stopped.

In achieving this effect you film your scene normally up to the point where you want a person or object to vanish or appear. At that point you tell your players to "freeze" in their positions as you stop your camera. While the camera is stopped you remove whatever you wish to vanish. Then you continue the normal filming of your scene.

Much fun can be obtained by the substitution of one object for another, such as replacing a cup of tea with a bottle of beer, or a Ford sedan for a Rolls Royce. Try it out and you will have real fun after you have practiced it a few times.

Bombing Effects

Some ambitious amateur may want to make a picture showing the effect of a bomb or other explosion in a house. This can be done with a minimum of danger to your furniture and with great screen effectiveness without wrecking your room.

Just place a metal pan on the floor close in front of the camera. In the pan put a little old-fashioned flash powder. When you are ready for your explosion ignite the flash powder. When the smoke from the powder has obscured the camera's view, stop the camera. Then you scatter the furniture around to suit your fancy. Break lamps or glassware, or do what you want. When your room suits you, ignite some more flash powder in the pan, and as the smoke is clearing resume filming. On the screen you will see the flash of an explosion, a huge cloud of smoke, followed by a wrecked room. It's really very simple.

Distortion

If you wish to get a shot of a scene or individual slowly becoming blurred and distorted you do it this way.

Put a piece of optically flat glass (the type good filters are made of) in your filter holder or matte box. Start shooting your scene normally through this glass. When you want the distortion to start you simply spread some warm sweet oil along the top of the piece of glass and continue filming. The oil will flow down over the glass and as it does the scene becomes more and more distorted.

Some excellent nightmare scenes, or scenes such as an inebriated gentleman might see, can be obtained in this simple manner.

Making a Train Wreck

If you would like to make a picture of a railroad train leaving the tracks you can do it quite easily—and without wrecking the train.

Set up your camera on a tripod at a spot where you know the train is going to stop, with your camera placed so the engine will fill the frame when the train stops. As the train approaches begin shooting. Then, just as the engine completely fills the frame and stops, you jerk one of the tripod legs suddenly sideways and continue shooting. When you see it on the screen it will look as though the engine had come right off the track.

You can add other shots of the cars, making them look as though they were piling up, too BUT, remember this in making these shots you must have your camera at angle which does not show the ground.

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Individual Color Evaluations Vary, Scientist Discloses

THERE'S a wide difference in color evaluations by individuals. This fact was disclosed by Dr. J. H. Godlove, color scientist of central research laboratories of General Aniline and Film Corporation in paper presented at semi-annual technical conference of Society of Motion Picture Engineers in New York last month. Dr. Godlove explained that you cannot hope to "see eye-to-eye" with your wife, business associates, or anyone else unless you and they have the same visual response to different color mixtures in the light by which you observe a colored object.

Particularly Applicable to Color Films.

In the filming and processing of motion pictures, it was pointed out, this varying color response of the human eye requires constant study and attention, since color in a motion picture may be viewed by thousands of persons. To satisfy the color appreciation of moviegoers and amateur movie enthusiasts—as well as buyers of fabrics and other consumer goods—producers of these look increasingly to science for the means of achieving the best color characteristics for the average eye.

"One person of normal vision may require 30 percent of red light and 70 percent of green light to match a given yellow," Dr. Godlove stated, "While this proportion may have to be reversed to enable another person of normal vision to make the same match. Moreover, blue-eyed and brown-eyed persons match colors differently. The blue-eyed match colors at one end of the color spectrum, and the brown-eyed at the other end. The match made by the blue-eyed looks terrible to the brown-eyed, and vice versa."

Color Corrections

Color is a hybrid, Dr. Godlove said, and the job of the colorist is to correlate the two extremes of color stimulus and color preception by means of the intermediate—the hybrid color. He hailed the advance in color science which has enabled trained specialists in this field to devise color scales which solved a wide variety of consumer color problems. These color scales conform to what the average layman sees, thus crystalizing and making more definite the consumer's way of seeing and thinking about color.

Spectral Energy Important

Addressing the same session of the SMPE conference, Ralph M. Evans of Eastman Kodak Co., said that not only the color, but also the spectral energy distribution of the light source effects the colors obtained in motion pictures. For example, he said, a red object may photograph red with a given source of light—while another light source, which matches the first one visually but has a different distribution of energy at the different wave lengths, the object may photograph green. Though the human eye adapts to the color of the light source, he said, this adaptability does not overcome the effect of differences in energy distribution.

Films made for indoor photography are balanced for tungsten light, Mr. Evans pointed out, and adjustments are required to obtain satisfactory results with any light source having a much different distribution of special energy.

Russia Grabs German AGFA Plant, Process, Equipment

DECLARING that top motion picture technicians in Germany are receiving very attractive offers from the Soviet Government for employment of their skills in Moscow, Nathan D. Golden, chief of the Motion Picture Section of the U. S. Department of Commerce, said at the technical conference of the Society of Motion Picture Engineers in session last month at the Hotel Pennsylvania, New York that Hollywood may expect serious competition from Russia in the film markets of Europe, Asia, and perhaps even in South America.

Head of a Department of Commerce investigating mission which presented a report on the German Agfa Color Film Process at a session of the S.M.P.E. conference, Mr. Golden said the Russians are now turning out about four times as much color film at the Agfa Film Factory, at Wolfen, Germany, as the Germans did during the war.

Amplifying his statement that Russian offers are being received by German experts in this field, Mr. Golden said it is likely that many of them will go to Moscow, "willing or otherwise."

A substantial amount of technical equipment has also been obtained by the Russians from studios in those sections of Middle Europe which are under Soviet control, he said. At UFA's Templehof Studios and their new Babelsberg Studios, both in Berlin, and at the Rosenhugel and Sievering Studios of the Wein Film Company, in Vienna, he declared, "the Russians left nothing but the knobs on the doors."

Producers in Vienna and Prague have recently complained that some of the film they are now receiving from the Agfa film factory is brittle or otherwise defective, Mr. Golden said, and sabotage is suspected in some quarters.

He reported that the studios at Prague, now being operated by the Russians, contain three of the finest stages in the world. Built by the Germans in 1942, two of these stages are 30 by 40 meters in size, and the third is 30 by 50 meters.

Presenting the report that the Department of Commerce investigating team which recently returned from Germany, Harold C. Harsh, of Ansco, who was a member of the team, revealed that the bull-headedness of the Nazi Propaganda Ministry hastened an important advance in German cinematography which may benefit Hollywood and the American movie-goer.

A very significant "first" in the history of photography was established, according to the report, when the German motion picture industry applied the Agfacolor negative-positive method to the production of feature pictures in full color during the war, using monopack film for the first time for both taking and release printing of a 35mm feature.

"With the beginning of the war, and with no prospect of color motion picture imports from abroad," Mr. Harsh said, "the UFA and other studios were instructed by the German Propaganda Ministry to proceed with the production of feature-length color motion pictures using the Agfacolor negative-positive method.

"During our interview with the UFA people, it was indicated that they had not considered the method ready for feature productions, and proceeded only because of the government directive."

The result of this compulsory and supposedly premature application of the method, however, was the outstanding development in the field of photography in Germany during the war, Mr. Harsh said.

Fundamentally, he said, the method is based on the use of non-diffusing color components in the emulsion layers of a monopak film which, when developed by a special color-forming developer, yields azomethine and quinomine dye images in suit with silver images. The latter are removed during the processing by bleaching.

The method of preventing diffusion of the color components is a patented process which consists in producing dye coupling components that contain a long hydrocarbon chain radical as a part of the molecule, in such a position that it does not interfere to any great extent with the coupling reactivity.

Between 1940 and 1945, Mr. Harsh said, that the Germans used this process in making thirteen feature-length films and about 50 short subjects. Parts of most of the features were viewed by the Department of Commerce mission, he said, and while the overall impression was that the screen quality was inferior to the established American standard, some portions were particularly impressive for the sharpness of the screened picture.

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pullback shot

tracking shot

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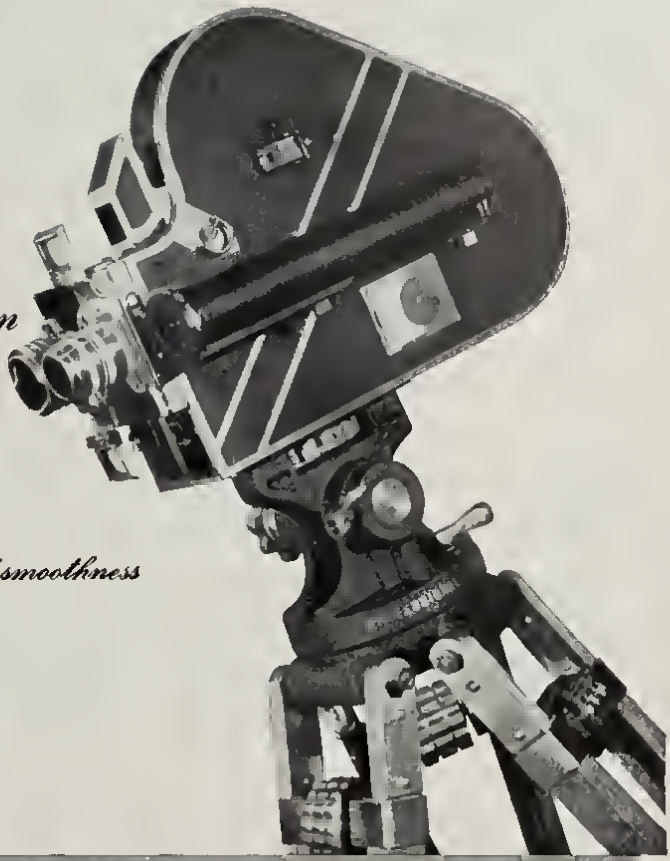

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AMONG THE MOVIE CLUBS

Metropolitan Club

Metropolitan Motion Picture Club of New York City is fast stepping up activities and various types of meetings for benefit of members. At May 10th meeting, held at Hotel Pennsylvania, film program included "Redouble Trouble," by Walter Bergman, which won first prize in Mount Vernon Movie Makers contest, "Trees That Grow in Brooklyn," by Leo J Heffernan, "In His Own Judgement," by Joseph J. Harley, winner of the 1944 Hiram Percy Maxim Award, and "Lip Synchronization" with the "Movie-Sound 8," a special demonstration by Lloyd Thompson of the Calvin Company.

Hunter Playhouse was the setting for the thirteenth annual Gala Night of Metropolitan on May 16th, at which time a specially selected program of outstanding amateur films were screened for members and guests. Sixteen millimeter pictures were shown on full size theatrical screen, with projection via a 3,000 watt arc projector. Subjects on the program included: "Interlude in Sunlight," by Martin Drayson; "The Inside Story," by Dan Billman, Jr.; "Land Snakes Alive," by Leo Heffernan; "The Dizzy Top," by Ryne Zimmerman, and "While the Earth Remaineth," by Frank Gunnell.

Submission of entries for the novice contest closes on June 3rd, with judging by membership to take place at the annual meeting on June 20th. At the latter session, elections will be held for four members of the board of directors whose terms expire this year.

Cinema Club of San Francisco

Cinema Club of San Francisco held its regular monthly meeting on May 21st at Women's City Club, with dinner preceding to celebrate 15th anniversary of the club's founding. Films lined up by program chairman Larry Duggan included: "Big Bridges," by Duggan, "Bryce and Zion National Parks," by Lloyd Littleton, "Wainright Parade," by Eric Unmack, "Tournament of Roses Parade," by R L Plath, and "Hetch Hetchy," by Leon Gagne, which was held over from the previous meeting. Total of 27 members visited the Domoto Nursery at Hayward on club-sponsored trip, and some fine films of the gorgeous oriental peonies in bloom are expected for showings at future meetings.

Brooklyn Amateur Cine Club

May 1st meeting of Brooklyn Amateur Cine Club held at Hotel Bassert featured the annual "Gunnell Nite," with Frank Gunnell presenting his "Al-Fra-Don Varieties," and "Animal Country;" in addition to an illustrated talk on titling. Walter Bergmann returned for the May 15th meeting to present a program of his exceptional films.

Seattle Amateur Movie Club

An uncut film contest is now under way among members of the Seattle Amateur Movie Club, with basic rules stressing the importance of careful planning before shooting of each scene. Entries for 8 mm. division are limited to 50 feet, while the 16 mm. contestants must be submitted within 100 feet. Aside from the splices for white leader, only one other splice is permitted in each subject submitted for the contest. Closing date will be set for several months hence, with winning entries in the two divisions to receive awards at club's annual dinner in December.

"Brookside," a 400 foot kodachrome production from ACL, featured the film program at May 14th meeting, which also included a discussion on various brands of cameras and projectors by members.

Parkchester Cine Club

Parkchester Cine Club of the Bronx, New York, is presenting its fifth annual movie show on evening of June 6th at St. Helena's church auditorium. Program, all films being made by club members, includes: "Old Fort Niagara and the Mighty Falls," by Henry F Goebel; "Bryce Canyon and Yosemite," by Alec Grossman; "St. Helena's on Parade," by John Arricale and Oscar Woelfle; "Eleanor at the Zoo," by Herbert Oesterle; and "Variety," premiere of a vaude show subject by George Kirstein. During the war, Parkchester members made several documentary films for Metropolitan Life Insurance Co.

La Casa, Alhambra

A J Zeman was chairman of the May 20th meeting of La Casa Movie Club of Alhambra, Calif., which presented a program of films through the courtesy of Pasadena Movie Club. Pictures included: "Snake and Dog," by Bert Sault; "Tournament of Roses," by Pasadena Movie Club; "Monument Valley," by Floyd Rittenhouse; "Nerine the Lily Beautiful," by A. Foster; and "Monarch Butterfly," by A. Fox.

Amateur M. P. Club, St. Louis

Members of Amateur Motion Picture Club of St. Louis enjoyed an extensive program at meeting held at Roosevelt Hotel on April 9th, with films projected including: "Yellowstone," by Arthur Bangert; "Holiday in Hollywood," by Frank Sperka; "Christmas," by Lon Wadman; "Taken for a Ride," loaned by Stamford, Conn. club; "Expectant Father," by George Valentine of Glenbrook, Conn.; and "Canadian Holiday," loaned by Joseph Hollywood of New York. At the April meeting, the club voted to raise dues from four to six dollars annually.

L. A. Cinema Club

Splendid program of films featured the May 6th meeting of Los Angeles Cinema Club, held at the Ebell Club with president Harry E Parker as chairman. Highlight of the film program was showing of the AAF "Last Bomb" for the first time before any amateur movie club. Royal R. Moss presented his reel of "local color" shots which proved to be very spectacular, while Guy D. Haselton exhibited his "Inside Passage to Alaska." Paul E Wolfe gave a most entertaining talk on his experiences as a police and news photographer.

Secretary-treasurer Jack Shandler announced a new club development whereby certificates will be issued to members traveling abroad, designed to secure for them easier access to desirable photographic locations and subjects. First of a series of technical session headed by Lorenzo Del Riccio presented brief talks by Karl Freund, A.S.C.; Hartley Harrison; and R. A. Buckley.

Philadelphia Cinema Club

Frank E. Gunnell, FACL, was honored guest with his wife at the May 14th meeting of Philadelphia Cinema Club held in auditorium of Witherspoon Building. In addition to exhibiting his Hiram Maxim award winning picture, "While the Earth Remaineth," Mr. Gunnell also showed his "Down Mexico Way" and "Sahuaro Land;" after which he gave a talk on the making of better movies. Meeting generated turnout of many prospective members to add to the large number of clubites present.

Utah Cine Arts Club

Regular monthly meeting of Utah Cine Arts Club of Salt Lake City was held on evening of May 15th, with film program and technical session for member information providing a most interesting session. Films shown included: "A Letter to Marjorie," by Dr. C. Elmer Barratt; "Atwood," by Kermit Fullmer; and "Nature's Art Gallery," Union Pacific kodachrome subject displaying the scenic wonders of the Bryce and Zion canyon districts.

Westwood Movie Club

George Loehrsen functioned as auctioneer at the gadget auction of Westwood Movie Club, San Francisco, at meeting held on April 26th. Loehrsen, also film program chairman, lined up group of pictures around the general title of "Filming the Family." Films included: "Sandra," by Ed Sargeant; "Barney and Graduation," by W. C. Johnson; "Christmas," by I. A. Kitzberger; "Delightfully Yours," by Frank Boichot; and "Family Album and April Wedding."

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Easier—because many carrying cases take Ciné-Kodak or Kodascope and a variety of accessory equipment . because you're ready for movie making or showing anywhere, at a moment's notice.

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And, because Kodak-made cases are built for a specific camera or projector, they're space-thrifty and convenient—each piece of equipment fits because the case is built that way.

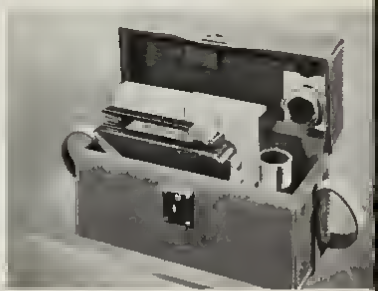
Yes, carrying cases have joined the return of Kodak movie equipment—in a choice of styles for some Ciné-Kodaks and Kodascopes.

Many are available right now at your Ciné-Kodak dealer's. Better see him—soon.

Standard Case for the Ciné Kodak Magazine 8 is built of handsome top-grain cowhide takes camera and two extra film cartons. An extra length of strap permits over-the-shoulder or hand carrying

Combination Case for the "Magazine 8" is constructed of finest cowhide holds camera, two accessory lenses, extra film magazines, Focusing Finder, and a full complement of Lens Attachments

Soft Leather Case accommodates either Ciné-Kodak Magazine 8 or 16 Of morocco-grain leather, the Soft Leather Case is of pouch-type construction with a zipper closure

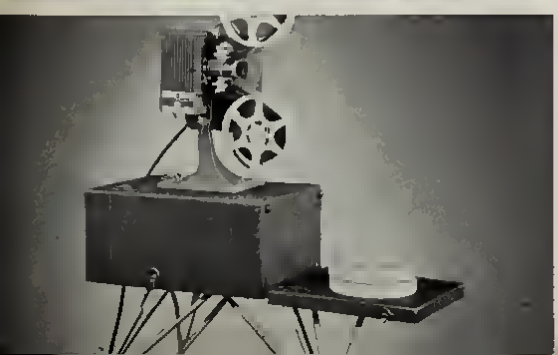


Combination Case for the "Magazine 16" takes camera, two telephoto lenses or the wide-angle lenses and adapter, a filter or supplementary lens in W mount, and two extra film magazines The Combination Case is built of handsome, durable cowhide

Far left **Carrying Case for Kodascope Eight-33** is light but sturdy built to stand up in use And it's handsome in appearance, too finished in airplane-luggage cloth

Left **Projecto Case for Kodascope Sixteen-10** doubles as carrying case and waist-high projection stand Here's the case packed, the entire assembly enclosed in a compact carrying case The legs fold easily into the compartment pictured on the near side

Left **The same case** in use as a projection stand for both Kodascope and film reels and cans Readily set up, the Projecto Case for Kodascope Sixteen-10 provides a waist-high projection stand—just the right height for convenient use Well-designed, sturdy construction makes it a rock steady base for the projector . makes it a case that really adds to the pleasures of movie screening



Compartment Case for Cine Kodak Magazine 16 accommodates a wide variety of accessories fills the needs of the movie maker who has or anticipates owning a full complement of auxiliary equipment Cowhide construction makes it tops in appearance

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Cinematography Magic

(Continued from Page 197)

Van Enger, A S C.,—all of the Warners' special effects department.

In addition to the obviously high quality of the trick effects, it can also be said that the caliber of general photography in "A Stolen Life" is far above average. Polito managed to inject mood by means of straight-forward yet atmospheric treatment of the subject matter. In one exterior sequence he used a combination of fog and harshly realistic lighting to produce a flat grey effect very well suited to the key of the action at that particular point in the story.

The entire film evidences a generous amount of production value and shows fine attention to detail in every department. Requiring six months of continuous shooting, and utilizing thirty-six major sets, the film establishes the rugged New England coast as a provocative setting for dramatic action. In reality, these sequences were shot at Laguna Beach—a swank, colorful, seaside artists' colony not too far from Hollywood. But the locales were selected with care and have a genuine rockbound Yankee character about them. During filming of scenes at this location, natives of Laguna were delighted to see a lighthouse take shape on a small island just off the mainland. They had been campaigning for just such a lighthouse for years; but they were sadly disappointed when, after two weeks of shooting the prop cardboard lighthouse was dismantled, packed up, and sent back to the studio.

Further location trips were made to Monterey and to Long Beach, where airport footage was shot. In addition, two complete New England towns were constructed on the back lot—one a simple fishing village, the other a pleasure resort erected on "Lake Warner." Here a full-size ferry boat was built upon iron trucks moving on rails beneath the surface of the water.

From the audience standpoint, "A Stolen Life" should play a merry tune at the box-office. From the technician's standpoint it proves that teamwork in production shows up favorably on the screen. In presenting something truly unusual and outstanding in the way of cinematographic special effects, it emphasizes the point that the purpose of such effects is not to fool an audience, but to place on the screen as an integral part of the story an illusion of reality that could not be effectively achieved in any other way.

Monson Ansco Trade Advisor

Harry Monson has been appointed to newly-created post of special advisor on trade relations by Ansco. Recently district manager for the company in Chicago, Monson is veteran of 42 years in the photographic business. Harold A. Edlund takes over the Chicago post for Ansco.

A scene from the violently realistic storm sequence of "A Stolen Life", produced with the aid of process backgrounds, wind machines and 90,000 gallons of water released from typhoon chutes.

Armat Honored by SMPE

Thomas Armat, inventor of the first projection machine employing a loop-forming means and giving the film longer period of rest and illumination than the time required for movement from frame to frame, was presented with a Scroll of Achievement at semi-annual technical conference of Society of Motion Picture Engineers last month in New York. Presentation to Armat was on 50th anniversary of his first exhibition of his projector at Koster and Bial's Music Hall, New York. Albert Warner accepted achievement scroll presented to Warner Brothers for pioneering leadership in the development of sound motion pictures, 20th anniversary of which is being celebrated for the next several months.

Los Angeles Eight

Entries in the Los Angeles 8mm. Club's 50 foot contest were exhibited at May 14th meeting held in the Bell & Howell auditorium. Sylvia Fairley's "There Ain't No Justice" was the winner; second honors went to "Swim Meet" by Fred Evans; while "Bringing Down Father" by L. B. Reed won third prize. Contest committee chairman William Wade also showed his "Hello, Honey, How Yo' All?", which he filmed on a recent trip through the deep south.

Club's first outing of the year will be staged June 2, with members journeying to Charlton Flats on the Angeles Crest Highway for combination social and filming activities.

Westwood, San Francisco

Program of nationally-famous amateur films and contest winners was presented by Westwood Movie Club of San Francisco on May 24th at Aptos Junior high school auditorium for members, guests and the general public. Pictures included: Frank E. Gunnell's "While the Earth Remaineth," "Grand Canyon," by Fred Harvey; "Chromatic Rhapsody," by Robert P. Kehow; and "Outside the Big Top," by Guy Nelli.

PSA Organizing Movie Division

Organization of a motion picture division for the benefit of PSA members and other amateur cinematographers and their clubs has been announced by the Photographic Society of America. Acting chairman of the new division is Harris B. Tuttle, of Rochester, who is an Associate of PSA and Fellow of the Royal Photographic Society and of the Society of Motion Picture Engineers.

The new Division, which takes its place beside PSA's Camera Club, Color, Historical, Nature, Pictorial, Press, and Technical Divisions, will sponsor authoritative articles in "PSA Journal," arrange for club interchange of amateur productions, and report on the use of equipment and methods of interest and aid to amateur movie makers. The division plans to cooperate with the Amateur Cinema League, Society of Motion Picture Enginers, and the American Society of Cinematographers, and to provide material of interest to operators of 8mm. and 16mm. equipment.

Organization of the division has been planned for some time in an effort to provide PSA members with complete photographic service, but was interrupted by war. The first 100 PSA members to become affiliated will be recognized as charter division members.

GE Photolamp Data Sheet

Essential data pertaining to all G-E lamps used for photographic purposes have been compiled and highlighted in a new free folder published by G. E. Lamp Department at Nela Park, Cleveland.

Departmentalized by subject, the folder permits the user to quickly put his finger on any desired bit of photolamp information. It represents an enormous amount of photographic information boiled down to "sugar" in the form of time-light curves, exposure and lamp specification tables, photos, and charts.

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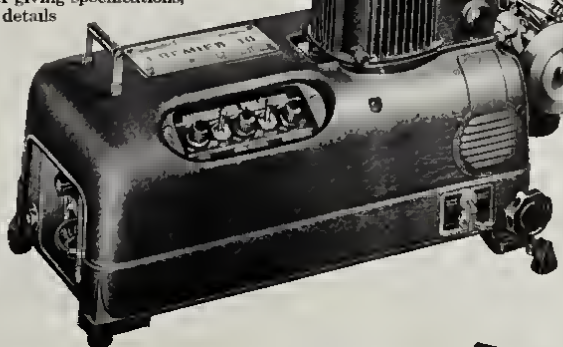

The Army-Navy E has been awarded to Ampro for excellence in the production of 16 mm. motion picture projectors.

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AMPRO CORPORATION ★ CHICAGO 18

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Specialized Photography

(Continued from Page 195)

make the color records of value, they must be capable of being printed for reports, so an extensive color printing service has been instituted which can turn out as many as 500 prints per week. The original transparencies are processed in our own laboratory. The color prints are made by direct contact, or by enlargement from the original transparencies and are also entirely processed with our extensive facilities.

The organization is constantly experimenting with new problems and applications for enlarging its scope and attacking new problems. New applications of infrared, x-rays, photomicrography, radar, stereoscopic processes, cathode-ray oscilloscopes are constantly being tried to discover new approaches for the solution of problems presented to this organization. The limits of photography as an aid to engineering have by no means been reached.

High-Speed Photography

High-speed photography as practiced at Wright Field may be conveniently divided into 2 general classifications high-speed motion pictures, high-speed still pictures. Each of these may be subdivided into qualitative records and quantitative studies.

High-Speed Motion Pictures

Continuous Light—To make the high-speed motion pictures, several pieces of equipment are in use. The Western Electric Fastax camera, in both the 8-mm and 16-mm sizes, is used for the bulk of the projects. Although the Eastman Type III 16-mm camera is gaining favor, each camera has certain advantages for various types of problems.

These cameras operate on the principle of continuous film motion, the individual frames being defined by a glass prism which, by rotating, moves the image formed by the camera lens along with the advancing film.

The definition obtained with this type of optical compensation is not as good as with the standard intermittent motion, but it is adequate for any but the smallest detail. The best use of these cameras is made by filming close-ups of the most important action and in this way not depending upon rendition of small detail.

At full speed, the 100-ft of film take about 1½ to 2 sec to pass through, so exact timing of the starting of the cameras is essential. It is all too easy to have the important action occur after the film has passed through the camera.

In one application where it was desired to record the final velocity of a cart falling in a vertical track, a switch was installed on the track to turn the camera on just before the cart appeared in the picture, thus assuring that the camera would be running at that time. The switch was then moved up the track until the camera started ½ sec before the cart arrived in the scene. In this way the camera was allowed to come up to its full speed of 4000 pictures a sec before the cart appeared.

To measure the velocity of the cart it was necessary to determine the distance traveled in a certain time. The track was marked in one-inch distances by painting the track white and laying on strips of black scotch tape one inch wide every other inch. To improve the accuracy of the measurement a vernier scale was painted on the cart so it would move along the track markings. Thus a reading every tenth of an inch could be made.

The time record on the film was made by means of a 200-cps spark originating in a vibrating-reed timer built for the purpose by our organization. A vibrating reed has its output voltage stepped up by a transformer to a point where it trips the grid of a Strobotron tube. The output of the Strobotron is put through a spark coil on the camera which is connected to the sparking electrode in the camera body. A spark flashes against the film sprocket, the light of the discharge making a small fog mark on the edge of the film every 5 milliseconds.

Thus time and distance were recorded on the same film from which velocity may be calculated. By drawing the curve of velocity against time it is possible to take the slope of the curve at any point and so calculate acceleration.

In this way a complete record is obtained not only of velocity and acceleration but of the appearances of the action in slow motion for visual study.

Lighting of the subjects to the required high intensity is provided by R-2 photofloods of small objects and up to 10,000-w units for larger areas. In bright sunlight, a maximum of 2000 frames per sec is all that the light will permit and still produce adequate exposure from light-colored subjects. For higher camera speeds, the subject must be illuminated with additional lighting units. A light truck equipped with four 3200-w floodlighting units and provided with its own generator was found to be a useful item for work in the field.

Processing

Because the exposure per frame of films made with the Fastax or Eastman Type III cameras is of the order of 1/5000 sec or less, the films are normally on the underexposed side. Special processing to obtain a printable film density is usually required. A fresh D-76 formula gives good density provided the development is carried from 30 to 60 min. To reduce the time of development, a more energetic print type of developer will cut the time to about 7 to 10 min. With this stronger developer it is necessary to use an anti-foggant to hold down the background fog; 6-nitrobenzimidazole has been found very effective for this purpose.

Removal of the opaque backing from the film has been found relatively easy with Eastman Kodak Super XX by a simple squeegeeing with a viscose sponge during final washing. The film must be doubly perforated similarly to "double eight," as usually supplied for 8-mm cameras. It is spooled in 100-ft. lengths and is a reversible-type film although we develop it as a negative for convenience and extra speed.

In the laboratory, rack and tank development has proved more practical than machine processing because of the long developing time required to obtain sufficient image density. In the field a G-3 tank is capable of producing good results. The roller in this tank is replaced with a viscose sponge to aid in removing the backing from the film. A collapsible drying rack designed for the Air Corps is a convenient accessory to hold the film while the moisture is evaporating from it.

Analysis of the Film

After processing, the film must be studied for information that will enable performance curves to be drawn for the subject under analysis. The timing marks along the edge of the film are usually reduced to a frames-per-second figure for important parts of the film where the action occurs. Where the whole film is to be analyzed, a curve is drawn of film length measured in feet from the beginning of the film against frames per second. In this way, the time interval measured from one frame to the next may be taken off the curve for any part of the reel while it is measured on a footage counter.

The action is viewed frame by frame with special projectors originally designed to analyze gun sight aiming point camera records. The image may be projected on a screen up to exactly original size and measurements of distance thus made directly on the screen. By interposing a mirror in the beam of the projector and reflecting the image back toward a translucent screen near the projector, the analyst may operate the projector and measure the screen without leaving his chair. A scale on the floor along which to slide the mirror enables the operator to consult a table and so enlarge the image to any desired extent without trial and error by setting the mirror at predetermined distances from the screen.

Large transparent protractors and scales to use on the screen enable the analyst to work quickly and accurately. After the points for the velocity curve have been plotted, a special tangent scale devised by our chief analyst is used to obtain the points to plot the curve of acceleration.

Achievements with the High-Speed Cameras

While the films made with high-speed motion picture cameras often appear spectacular, it is usually the more prosaic looking picture that produces the most significant results. The close-up of a wheel on the landing gear of a B-24 during the process of making contact with the ground during an actual landing is very dull screen fare, but it

yielded curves and figures that explained a great deal about the flexures a tire undergoes during the violent impact at landing.

Studies have been made of aircraft machine gun malfunctioning which proved the correctness of the theory of one of Wright Field's experts and revised the thinking of the gun manufacturers.

Under the analytical eye of the high-speed camera have come aerial camera shutters, jet propulsion engines, bursting propellers, exploding oxygen containers, explosively operated radio antennae, electrical relay actions, manual gun charging operations, aircraft launching devices, and a host of other engineering projects.

Intermittent Light High-Speed Motion Pictures

Another important piece of equipment in use is the Edgerton flashing light high-speed camera. As is well known to most engineers in this field, this camera utilizes special gaseous discharge lamps whose flash is so short that it stops the action not only of the subject but of the continuous moving film in the camera as well. The film is 35-mm in width and 100 ft. long. The film passes through the camera in 1½ sec when the driving motor is set to full speed, taking 1500 pictures per sec. A contactor on the main sprocket wheel fires the lamps every time a new frame is in position back of the aperture plate.

A spark electrode in the Edgerton camera places a time record on the film so that time duration, velocity, and acceleration may be measured.

Incidentally, a comparison of the 3 types of high-speed cameras — the Fastax, the Eastman, and the Edgerton —brings to light the fact that 100 ft. of film passes through each in 1½ sec at full speed. The linear film velocity is the same, therefore, in each camera, the different frames per second rates being a result of the difference in frame size.

The Edgerton camera can be used only in subdued light because the lens is open all the time; therefore its operation is restricted to laboratory applications. The shortness of the flash, which amounts to 1/100,000 sec, and the relatively large frame size compared to the 8- or 16-mm films made by the other cameras make possible the recording of greater detail in the pictures. Single frame enlargements up to 8 × 10 in. of the important phases of the action are readily made for inclusion in reports, a valuable aid in explaining data.

Because of the shortness of the flash, normal speed films are barely exposed. Even the fastest films leave a great deal to be desired because the severe reciprocity failure of the film reduces the effective exposure considerably. The blue color of the discharge lamp's flash utilizes only a portion of the wide spectral sensitivity of the fast panchromatic emulsion.

Adding all these restrictions together pointed to the need for finding a high-speed blue-sensitive emulsion that could be developed vigorously. A blue-sensitive film made especially for recording the fluoroscopic screen of x-ray apparatus was finally adopted as incorporating all the features desired. This film still has to be developed for 30 to 60 min but the results are reasonably satisfactory.

The coolness of the flashing light technique, as contrasted to the incandescent glare of the continuous light camera, indicates that for biological pictures and subjects whose actions would be affected by temperature rise, the Edgerton equipment would prove superior. It can, however, photograph only relatively small objects because of the low light output.

The continuous light cameras are lighter, smaller, cheaper, and simpler to operate and will make pictures in daylight. Each type of apparatus has its particular advantage and application.

Sequence Flashing

Some actions are too fast for even the high-speed cameras to catch. What is more, the bursting of an airplane propeller under increasing speeds cannot be anticipated, so it is impossible to start a motion picture camera in time to be operating at full speed at the exact moment required. Even if the camera were operating at the proper time, it is doubtful if more than two frames would record the action. A different technique had to be evolved to handle problems of this nature.

If a series of electrical discharge lamps were lined up and their condensers charged, they may be fired in sequence at almost any rapidity desired. For relatively small but fast objects such as bullets, 6 Edgerton microflash units were assembled. These units emit a flash of light whose duration is 1/500,000 sec. The condensers in each unit require several seconds to charge from a 7000-v supply, but once charged the units may be fired one after the other in rapid succession.

A sequencing device was designed and constructed that would fire each lamp in turn electronically from 1/12 sec to 1/20,000 sec between flashes. By means of a microphone feeding into an amplifier, the sound of the gun initiates the sequence and the lights flash in succession. Of course, the picture is made in darkness, the flashes of light exposing the film. The picture is taken on an ordinary still camera loaded with fast blue-sensitive film which is developed vigorously. In this way pictures of bullets may be photographed striking armor plate and shedding their jackets. A series of bullet images appear in one picture showing successive stages of the action.

Although the microflash units have a relatively short range and angle of spread, helicopter rotors up to 38 ft. across have been successfully photo-

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graphed during rupture. To accomplish this end, the blades were painted white, a fluoride-coated f/2.5 lens was used on the camera, and the fast fluorographic film developed to completion. Ten minutes in straight D-72 with an antifoggant added is not unusual to bring up an image adequate for printing.

In the case of the helicopter propeller rupture, a wire was cemented to the blades and brought out through a slip-ring device normally used to connect strain gauges to recording instruments. The wires were connected to a transformer and battery in series. The secondary of the transformer was close to and connected into the input of the triggering amplifier. The transformer enabled the circuit comprising the rotor and slip-ring to retain a low impedance and so be relatively free from pickup disturbances. The rupturing of the rotor broke the wires and initiated the sequence of flashes.

Because the camera with its fast lens and film was set for time exposure to catch the moment of rupture, the whole propeller test laboratory had to be darkened completely. Windows that could not be covered in the enclosing structure made it necessary to perform the test only after darkness fell. One of the first pictures made with this equipment shows pieces of the fabric blade flying away from the rotor. The success of the results obtained so far has warranted the building of a new sequence flasher of far greater light output to be permanently installed in the propeller test laboratory for continuing research.

Flash Techniques

In some cases where the action is continuous, pictures are required at intervals that do not approach motion picture frequency and yet each picture must be made with extremely short exposure. An actual case was a helicopter hovering above the ground. Pictures of the blades were required to determine coning angle and bending.

An aerial night photographic flash unit was adapted to ground operation for this purpose. This unit emitted an extremely powerful flash of light whose duration was only 1/5000 sec. The flash could be repeated 3 times a sec. An aerial camera taking a 5 × 7-in. picture had its shutter removed and its mechanism altered to move the film continuously. The lens was set into a focusing mount and the camera set upon a Mitchell tripod. A contactor was installed in the camera to flash the light every time a fresh 5-in. length of film came into position.

When darkness fell on the flying field and everything was in readiness, the helicopter pilot was given the signal to make the aircraft rise to a hovering position. At the same moment, the camera was started and the light was fired by the film metering rollers inside. A series of pictures was thus obtained showing the blades of the helicopter sharply defined against a black sky. Measurements could then be easily made of the angle and deformation of the blades.

Individual flash pictures may, of course, be made with the same equipment. An example of such an application was the request made by the Propeller Laboratory to photograph the successive stages of the building up of ice on a propeller. The request stated that this was not to be done in the wind tunnel but must be accomplished under actual icing conditions in the air. To complicate matters further, it was considered too dangerous to make the flight at night, sufficient hazard being encountered during daylight operations in icing clouds.

The problem was finally solved by the combination of several techniques and the development of a new discharge lamp. The regular lamp of the night photographic unit was replaced with a short duration tube. This tube flashed in about 1/20,000 sec. To make the picture, a wide-angle camera was constructed which could be operated entirely from the rear and so rigid that it would keep in focus despite the vibration of the airplane. A contactor was fitted to the shutter to fire the flash when the blades were wide open. In this way, the effect of daylight would

be kept to a minimum with a high shutter speed.

The camera and lamp were installed in the cockpit of the B-25 Mitchell bomber directly behind the pilot, viewing the blades of the propeller perpendicular to their axis of rotation. The success of the whole project depended upon 3 factors: (1) overpowering the daylight with flash, (2) a fast enough flash to stop the propeller, and (3) sufficient contrast to be obtained between the cloud background and the propeller blade to show the latter to its best advantage.

To achieve the last requirement, color contrast was tried and found to be of considerable help. Ansco Color Film was loaded into the camera and the propeller blades of the airplane painted bright red. The name of the B-25, *Flaming Mamie*, was no meaningless term as one glance at the flaming color of the propeller would prove.

Motion Picture Theodolites

Recording theodolites are used effectively at Wright Field for the location in space of moving aircraft, parachutes, and slow-moving missiles. The recording theodolites are essentially motion picture cameras whose azimuth (panorama from the north point) and site (tilt from the horizontal) are recorded on the film simultaneously with the picture. A clock is also recorded for the purpose of matching pictures taken at the same time from 2 stations. The theodolites are always used in pairs so that triangulation from their 2 positions defines the position of the subject. The clocks on the 2 instruments may be synchronized by radio so that accuracy in timing is assured. From the observations recorded by these theodolites, three-dimensional space graphs may be plotted to depict the exact motion of an object in the air.

With these instruments, the flight path of a helicopter was recorded and plotted to prove that such an aircraft requires some wind to produce vertical ascent. The oscillations and drift of a parachute were also measured.

Conclusion

Motion picture technique has been put to work in the ways enumerated to aid in the solution of engineering problems at Wright Field, the experimental center of aircraft development for the Army Air Forces. Under the pressure of war, the satisfactory solutions to these design problems had to be found quickly. The success which attended the application of these new photographic analytical methods was so complete that this work is expanding to an ever-increasing extent.

CAMERA EQUIPMENT CO. "PROFESSIONAL JUNIOR" AVAILABLE FOR IMMEDIATE DELIVERY

The new "Professional Junior" Geared Pan and Tilt head, with or without tripod base, is now available for instant delivery right from stock, it was announced by Frank C. Zucker, President of Camera Equipment Company, manufacturers of world-famous "Professional Junior" camera equipment.

Interchangeable with "Professional-Junior" friction-type removable head, it also fits "Professional Junior," "Hi-Hat," and "Baby" tripod base. Takes 35mm. Eyemo, DeVry, Cineflex, and all 16mm. amateur and professional 16mm. cameras—with or without motors. Also adapted for W. E. Fastex, E. K. High Speed, and all still cameras.

Geared pan and tilt head made of genuine DowMetal (magnesium) weighs only 5½ lbs. With standard legs, complete tripod weighs 14½ lbs. Worm driven gears are government specification bronze. Snap on crank handles are all-metal with aluminum knobs. Smooth, steady 360° pan and 65° tilt action control is obtained from both right and left sides. All exclusive features of "Professional Junior" removable head tripod are incorporated in new Geared Pan and Tilt model.

Mr. Zucker stated, "It has always been the policy of Camera Equipment Company to bring to professionals and amateurs alike the finest camera equipment that can be made. All new materials such as DowMetal, which is now used for many Camera Equipment parts, gives our equipment new strength and lightness. To assure long life for equipment, all parts that undergo severe usage are made of finest heat-treated steel and in many cases extra-hard bronze.

"All Camera Equipment has always been designed not only to look good and give long service, but in addition, every possible plus functional feature has been built in. In short, it has been our purpose always to give Camera Equipment's customer the latest, most up-to date equipment — the kind that helps him to do a highly professional job in all his shooting."

Seager Joins Ansco

Charles W. Seager has been named to head the professional motion picture products section of Ansco's Binghamton sales staff.

San Francisco Westwood Sets Active Program

The Westwood Movie Club of San Francisco has started the 1946 amateur movie makers season with a bang! Under the expert leadership of Fred Harvey the January dinner, held in one of San Francisco's leading restaurants, was attended by 75 members and guests. The February meeting was devoted to demonstrations of colored film by the Ansco people. The March meeting was devoted to a very interesting and educational demonstration of sound on wire.

During the month of May, the Westwood Movie Club will attempt its first civic project of any size. One afternoon will be devoted to showing 16mm amateur movie films to the pupils of the Aptos Junior High School. In the evening an entirely new show will be put on in the Little Theater of the Aptos Junior High School for the entire community. Over 1,000 people are expected to attend.

Classes are now being formed to instruct beginners in the use of their equipment, how to take pictures, how to make titles and all phases of motion picture photography. This promises to become one of the most outstanding projects of the club.

All amateur motion picture makers in the San Francisco Bay area are invited to attend the meetings which are held on the last Friday of each month in the club room at the St. Francis Community Hall, Ocean Avenue and San Fernando Way, San Francisco.

Ansco Perfecting Faster Color Negative

The means for producing a color negative film with a speed comparable to average black-and-white films was announced by research scientists of General Aniline and Film Corporation and its Ansco Division, meeting in a special research forum recently.

The new film, of which only small experimental coatings have been made, is about 50 per cent faster than any color negative film at present generally available. Its speed corresponds to a Weston rating of 32 or G. E. 48.

The new fast color film, discovered cooperatively by chemists and scientists of Ansco and General Aniline in the experimental work on color negative, is achieved through a combination of several factors, including emulsion techniques, and the development of new color forming substances.

Availability of the new fast color film will depend on experimental work now being conducted, an Ansco spokesman said. He pointed out that, although test exposures under varying conditions had been highly satisfactory, a full exploration of the possibilities of the new techniques is in its initial phase.

New Filmo Sound Library Releases Announced

THE MERRY MONAHANS (Universal) 9 reels

A cavalcade of vaudeville leading from the three-a-day to the Follies. Excellent comedy, music, and a pleasant dash of nostalgic sentiment. One of the better films. (Donald O'Connor, Peggy Ryan, Jack Oakie) Available from March 15, 1946 for approved non-theatrical audiences.

SAN DIEGO, I LOVE YOU (Universal) 8 reels

An ambitious girl can get places even when weighted down with four obstreperous kid brothers and a dreamy schoolteacher father who turns inventor. Good clean comedy. (Jon Hall, Louise Allbritton, Edward Everett Horton, Eric Blore, Buster Keaton). Available from March 29, 1946 for approved non-theatrical audiences.

WHAT BIRD IS THAT? 3 reels

Teacher-made color films of American bird life, arranged in novel form to encourage student participation. Each bird is pictured in typical habitat, size, feeding and nesting habits, and other distinguishing features are shown—then a pause for discussion, and the answer is given. A quick review concludes the reel. Producer David Schneider, editor Wm. F. Kruse.

THE SINGING SHERIFF (6 reels)

A truly unique musical Western that kids itself in clean uproarious satire. There is rhyme and reason even in the introduction of the musical numbers, and an inspired commentator helps further to take it off the beaten path. (Bob Crosby, Fay McKenzie, Samuel S. Hinds, Fuzzy Knight) Available from April 6, 1946 for approved non-theatrical audiences.

BOWERY TO BROADWAY (Universal) —9 reels.

Two rival Irish showmen battle all the way from the Bowery to Fourteenth Street and finally to Times Square. "Show Business" excellently and amusingly shown. (Jack Oakie, Susanna Foster, Turhan Bey, Ann Blyth, Maria Montez, Donald O'Connor, Louise Allbritton). Available from May 3, 1946, for approved non-theatrical audiences.

RECKLESS AGE (Universal)—6 reels.

Poor little rich girl runs away to become a salesgirl in one of her own chain stores—for a lot more fun plus business, romantic and other complications. (Gloria Jean, Henry Stephenson, Judy Clark, Franklin Pangborn). Available from May 17, 1946, for approved non-theatrical audiences.

ENTER ARSENE LUPIN (Universal)—7 reels

Famous fiction character excellently portrayed in new thriller that involves a fabulous emerald, a pretty girl, romance, rescues and a police inspector almost, but not quite, smart enough to catch the Robin Hood crook. (Charles Korvin, Ella Raines, J. Carroll Naish). Available from May 24, 1946 for approved non-theatrical audiences.

DESTINY (Universal) 7 reels

Blind girl proves able to see good in hard-driven victim of circumstances about to take criminal path. Opens with exciting chase, then develops story by fine flash-backs leading to suspenseful climax. Excellent morale and discussion subject for churches, schools and clubs. (Gloria Jean, Alan Curtis, Frank Craven, Grace McDonald.) Available from June 22, 1946, for approved non-theatrical audiences.

HI, BEAUTIFUL (Universal) 6 reels

Light comedy of errors involving the home fires of a "model home" just a little too complete with all human accessories. Charming original twists. (Martha O'Driscoll, Noah Berry, Jr., Hattie McDaniel, Walter Catlett.) Available from June 8, 1946, for approved non-theatrical audiences.

MY GAL LOVES MUSIC (Universal) 6 reels

Stranded show-girl team improvises a mother-and-daughter act to win medicine show's local talent contest—a trip back to dear old Broadway. (Bob Crosby, Grace McDonald, Betty Kean, Alan Mowbray, Walter Catlett.) Available from June 15, 1946, for approved non-theatrical audiences.

MUTINY ON THE ELSINOR (7 reels)

Super-feature that follows Jack London's sea thriller. Paul Lukas (Academy "Oscar" winner) plays the part of an author who takes passage aboard a sailing ship in search of color for a novel, but finds more than he had bargained for. The ship is buffeted by storms, her captain killed, and life aboard made exciting by a mutiny. For days a struggle for control is waged, with victory by the writer, the captain's daughter, and the loyal members of the crew. This is a clean, exciting, vigorous adventure tale.

Current Assignments of A. S. C. Members

As this issue of American Cinematographer goes to press, A. S. C. Director of Photography are assigned to the following productions currently shooting in the various Hollywood studios

Columbia Studios

Burnett Guffey, "Gallant Journey," with Glenn Ford, Janet Blair, Henry Travers, Charles Ruggles

Rudy Mate, "Down to Earth," (Technicolor), with Rita Hayworth, Larry Parks, Marc Platt, Edward Everett Horton, James Gleason

Charles Lawton, jr., "Thrill of Brazil," with Evelyn Keyes, Keenan Wynn, Ann Miller, Allyn Joslyn, Tito Guizar, Veloz and Yolanda

Henry Freulich, "It's Great to Be Young," with Leslie Brooks, Bob Stanton

Hal Roach Studios

John W. Boyle, "Curley," (Cinecolor), with Frances Rafferty, Larry Olsen, Eilene Janssen

International Pictures

Lucien Ballard, "Bella Donna," with Merle Oberon, George Brent, Charles Korvin, Paul Lukas, Lenore Ulric

Metro-Goldwyn-Mayer

Harold Rosson, "My Brother Who Talked to the Horses," with Peter Lawford, Beverly Tyler, Butch Jenkins.

Joseph Ruttenberg, "A Woman of My Own," with Greer Garson, Richard Hart, Bob Mitchum

Robert Planck, "Uncle Andy Hardy," with Mickey Rooney, Bonita Granville, Dick Simmons, Dorothy Ford

Charles Schoenbaum, "The Mighty McGurk," with Wallace Beery, Edward Arnold, Alme McMahon

Sidney Wagner, "High Barbaree," with Van Johnson, June Allyson.

Ray June, "Beginning or the End," with Lionel Barrymore, Brian Donlevy, Robert Walker, Beverly Tyler

Paul Vogel, "Lady in the Lake," with Robert Montgomery, Audrey Trotter, Leon Ames

Harry Stradling, "Sea of Grass," with Katherine Hepburn, Spencer Tracy, Melvin Douglas

Monogram

Harry Neumann, "Ghost Busters," with Leo Gorcey, Tamis Chandler

Ira Morgan, "High School Hero," with Freddie Stewart, June Preisser, Ann Rooney

Paramount

Charles Lang, "Where There's Life," with Bob Hope, Signe Hasso, William Bendix, George Coulouris

Jack Greenhalgh, "I Cover Big Town," (Pine-Thomas) with Philip Reed, Hillary Brooke, Robert Lowery

RKO

Edward Cronjager, "Honeymoon," with Shirley Temple, Franchot Tone.

Gregg Toland, "The Best Years of Our Lives," (Samuel Goldwyn Prod.) with Myrna Loy, Frederich March, Dana Andrews, Teresa Wright

Lee Garmes, "The Secret Life of Walter Mitty," (Technicolor) (Samuel Goldwyn Prod.) with Danny Kaye, Virginia Mayo, Fay Bainter, Boris Korloff.

Victor Milner, "It's a Wonderful Life," (Liberty Films) with James Stewart, Dona Reed, Lionel Barrymore, Thomas Mitchel

Harry Wild, "Nocturne," with George Raft, Lynn Bari

Robert de Grasse, "Deadlier Than the Male," with Claire Trevor, Lawrence Tierney, Walter Slezak

Milton Krasner, "Katie for Congress," with Loretta Young, Joseph Cotten, Ethel Barrymore

Republic

Archie Stout, "Angel and the Outlaw," with John Wayne, Irene Rich, Gail Russell, Bruce Cabot, Harry Carey.

John Alton, "Snow Cinderella," (Walter Colmes Prod.) with Lynne Roberts, Charles Drake

20th Century-Fox

Arthur Miller, "The Razor's Edge," with Tyrone Power, Gene Tierney, John Payne, Anne Baxter, Herbert Marshall, Anne Revere.

Joe MacDonald, "My Darling Clementine," with Henry Fonda, Linda Darnell, Victor Mature, Cathy Downs, Walter Brennan, Ward Bond

Harry Jackson, "Carnival in Costa Rica," (Technicolor) with Dick Haymes, Celeste Holm, Cesar Romero, Vera-Ellen.

Glenn MacWilliams, "You're For Me," with Vivian Blaine, Harry James, Carmen Miranda, Perry Como, Phil Silvers

Benjamin Kline, "Flight to Paradise," (Sol Wurtzel Prod.) with Paul Kelly, Osa Massen, Hillary Brooke.

United Artists

Karl Strauss, "The Short Happy Life of Francis Macomber," (Award Prods.) with Gregory Peck, Joan Bennett, Robert Preston, Reginald Denny.

Leo Tover, "Abie's Irish Rose," (Crosby Producers, Inc.) with Michael Chekhov, Joanne Dru, Vera Gordon, George E. Stone.

Russell Metty, "Bel Ami," (Loew-Lewin, Inc.) with George Sanders, Angela Lansbury, Ann Dvorak, Frances Dee, Marie Wilson.

Lucien Andriot, "Dishonored Lady," (Mars Films) with Hedy Lamarr, Dennis O'Keefe, John Loder, William Lundigan

Robert Pittack, "Miss Television," (Comet-UA) with David Bruce, Cletus Caldwell

Mack Stengler, "The Devil's Play-

LINING UP FOR A CLOSEUP George Folsey A S C , Director of Photography on Metro Goldwyn Mayer production, 'The Green Years , sets the lighting for a closeup of Hume Cronyn seated at table Victor Saville directs the picture

ground," (Hopalong Cassidy Prods.) with William Boyd, Andy Clyde, Rand Brooks, Ealine Riley

Franz Planer, "The Chase," (Nero Prods.) with Robert Cummings, Michele Morgan

Universal

Virgil Miller, "The Michigan Kid," (Cinecolor) with Jon Hall, Rita Johnson, Andy Devine

Hal Mohr and W. Howard Greene, "Pirates of Monterey," (Technicolor) with Maria Montez, Rod Cameron, Philip Reed, Mikhail Rasumny.

Elwood Bredell, "The Killers," with Burt Lancaster, Ava Gardner

Warner Brothers

Sol Polito, "Cloak and Dagger" (United States Pictures), with Gary Cooper, Lilli Palmer, Robert Alda.

Sid Hickox, "Cheyenne," with Dennis Morgan, Jane Wyman, Janis Paige

Arthur Edeson, "Stallion Road," with Ronald Regan, Zachary Scott, Alexis Smith.

Peverell Marley and William V. Skall, "Life With Father" (Technicolor), with Irene Dunne, William Powell, Elizabeth Taylor, ZaSu Pitts, Edmund Gwenn.

Ernest Haller, "Deception," with Bette Davis, Paul Henreid, Claude Rains.

Carl Guthrie, "Cry Wolf," with Barbara Stanwyck, Errol Flynn.

Hill Treasurer of Olesen Co.

Dan H. Hill has been appointed treasurer of the Otto K. Olesen Company, Hollywood distributors of 16 mm sound projectors and lighting apparatus. He was formerly an executive of Lockheed Aircraft Corp

Cooper Promoted by Florez, Inc.

Ray Cooper has been appointed photographic director of Florez, Inc. (formerly Visual Training Corp.) of Detroit. Cooper was associated with the photographic department of General Motors for several years

Telefilm Office Building Completed

In addition to housing the Telefilm executive offices, company's new building in Hollywood is being occupied by various producers utilizing the Telefilm production and laboratory facilities, Company's expansion plans provide for erection of a four story building to house the firm's studio and laboratories, with construction to start when materials become available.

Murtagh, McKenzie Promoted by Ansco

Thomas P. Murtagh has been named executive assistant to E Allan Williford, vice president of General Aniline and Film Corp. in charge of the Ansco division. Murtagh has been with Ansco since 1942, and previously was associated with Eastman Kodak and Consolidated Edison in executive capacities. Garfield A. McKenzie draws assignment to new post of chief position analyst.

Mathews With Princeton Film Center

Norman Mathews, who has had wide experience in production of training, documentary and educational films, affiliates with Princeton Film Center as director of production department.

Ansco Establishes 16mm Color Processing Plant in L. A.

New processing service for Ansco 16mm color film has been established at the company's Los Angeles branch office. Service is designed entirely for west coast amateurs, and only amateur lengths of Ansco color film will be handled. Similar processing facilities will be installed later this year in Chicago for midwest customers, company discloses.

Mitchell Resigns From Academy Post

Gordon S Mitchell has resigned as manager of the Research Council of the Academy of Motion Picture Arts and Sciences, concluding nearly 15 years service with the Academy, the last 12 years in the managerial post. Mitchell returned several months ago after 3½ years service in the Army Signal Corps as major in command of a motion picture unit in the south Pacific area.

ON NEWSREEL assignments or production work, when lighting conditions are extremely poor, the natural choice is the high-speed Eastman Super-XX Negative Film, one of the family of Eastman Films, industry favorites for more than fifty years.

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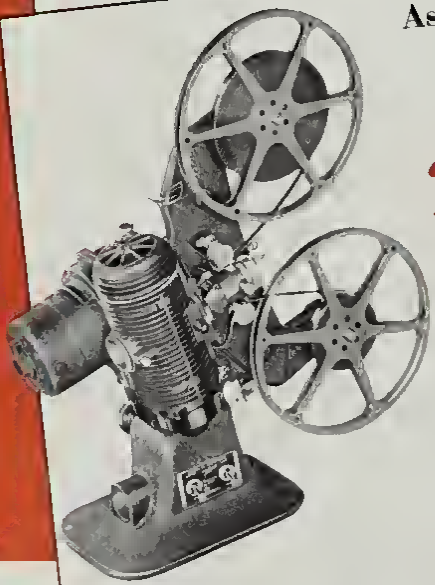

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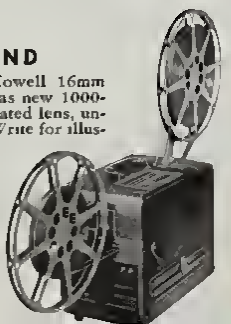

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